Medical Marijuana in Oncology

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Does MJ cure cancer?

• Suggestion from *in vitro* and animal studies that cannabinoids may impair growth of various cancers\(^1\) (leukemia, colon, breast, hepatocellular)

• Occasional case reports exist, but there are no clinical trials or even case series in medical literature to suggest anti-neoplastic effect of oral or inhaled MJ or its derivatives in humans.

• Similar data exists for many familiar substances: coffee, green tea, tumeric, etc.

1. Anticancer Research October 2013 vol. 33 no. 10 4373-4380
Does MJ cause cancer?

- Large retrospective cohort study showed cannabis use was not associated with tobacco-related cancers
  - Possible Increase in prostate cancer and testicular germ cell tumors\(^1\)
  - More studies needed
- Cannabanoid receptors expressed in several cancers, with expression correlating with aggressive phenotypes\(^2\).
  - Concern expressed about ESA use in oncology based on similar data

2. Pharmacology 2012;89:179-187

Smoking with lung cancer

- Tobacco cessation improves prognosis in lung cancer patients
  - ? If MJ smoking has similar adverse effect
Benefits in Oncology

- Antiemesis
- Appetite stimulant
- Antianxiety and sleep aid
- Antidepressant
- Analgesic

Comparative efficacy of cannabinooids as antiemetic

- Dronabinol and nabilone are FDA approved for chemotherapy-related nausea and vomiting (CINV)
- Neither medication appears in current CINV guidelines because of poor comparative efficacy to modern antiemetic regimens eg 5-HT3 receptor antagonists (ondansetron) or NK-1 antagonists (aprepitant)
- Placebo controlled data on inhaled MJ is less than compelling, but anecdotally it is clearly effective.
- No comparative data on inhaled or oral MJ exist
- Perception in the field is that MJ is a weak antiemetic for CINV compared with FDA approved therapies
Risk of Forgoing more active therapy

- For whatever reason, patients using inhaled marijuana as medication for chemo-induced nausea and vomiting tend to use it as a single agent rather than incorporate it into established strategies.
- Increasing frequency and intensity of use can result in more side effects without substantially improved symptom control.

Appetite stimulant

- Cannabis increases caloric intake in healthy persons, largely through between meal snacks, fatty and sweet foods.
- Oral THC was inferior to megestrol for weight gain in cancer-associated anorexia.
45 yo with Hodgkin Lymphoma

- Smoking MJ for chemo induced nausea while neutropenic
- Developed fever and cough

<table>
<thead>
<tr>
<th>Organism</th>
<th>RHIZOPUS SPECIES</th>
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<tbody>
<tr>
<td>Amphotericin B</td>
<td>Interpretation: 2</td>
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<tr>
<td>Itraconazole</td>
<td>Method: Amphotericin B CON (mg/L)</td>
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<tr>
<td>Posaconazole</td>
<td>Method: 1</td>
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<tr>
<td>Voriconazole</td>
<td>Method: Amphotericin B CON (mg/L)</td>
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Risk of invasive fungal infection

- MJ-associated invasive fungal infection (typically aspergillosis) during cancer treatment is well described.
- I advise my patients to not smoke while neutropenic because of risk of invasive fungal infection.
- Oral ingestion is ok but generally disliked by patients because of slow onset and unreliable bioavailability
- Strategies for heat or microwave treatment of marijuana exist to kill fungal spores
- This advice is almost universally ignored by patients.

*What safeguards are in place, either in quality control of product or in patient counseling, to ensure patients smoking ‘medical’ MJ aren’t inhaling potentially harmful pathogens while immunocompromised?*
Important tool in the supportive care armamentarum

- Overall side effect profiles compare favorably with many standard medicines
- Narcotic and benzodiazepene use is legion in cancer patients. These medications have more potential for addiction, abuse and harmful diversion than MJ.

Room for Improvement

- Comparative studies of marijuana against, or in addition to, existing treatments.
- Determining how to instruct patients in directions for use in the approved indication?
- Address concerns around safety (infection, drug interactions, etc)
  – Commitment of medical marijuana purveyors and enthusiasts to the safe and effective delivery of their product—even when inconvenient or unpopular-- is an indication of whether the ‘medical’ marijuana industry is truly interested in patient wellbeing.